Fundamental Mechanics: Quiz 1

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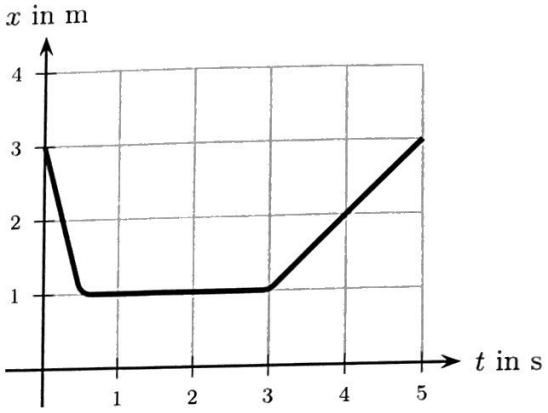
Formulae: $v_{\text{avg}} = \dfrac{\Delta x}{\Delta t} = \dfrac{x_f - x_i}{t_f - t_i}$ $\quad \Delta x = v_{\text{avg}}\Delta t$ $\quad x_f = x_i + v_{\text{avg}}\Delta t$

v_{avg} = slope of position vs time

An ant walks back and forth along a straight stick. The graph of the ant's position vs. time is as illustrated. Which of the following (choose one) is true?



i) The ant's speed at $t = 1\,\text{s}$ is the same as at $t = 4\,\text{s}$ and they are both zero.

ii) The ant's speed at $t = 1\,\text{s}$ is the same as at $t = 4\,\text{s}$ and they are not both zero.

iii) The ant is moving faster at $t = 1\,\text{s}$ than at $t = 4\,\text{s}$.

(iv) The ant is moving slower at $t = 1\,\text{s}$ than at $t = 4\,\text{s}$.

t=1 x=1 t=4S x=2

Briefly explain your answer.

$\frac{\Delta x}{\Delta t} = \frac{x_f - x_i}{t_f - t_i}$ $\quad \frac{2-1}{4-1} = \frac{1}{3}$

Speed at t=1 = 0 m/s

Speed at t=4S = 1 m/s